Appendix A

AIRS Information

P-050301 and T1-050308

AIRS/AFS[a] FACILITY-WIDE CLASSIFICATION[b] DATA ENTRY FORM

Facility Name: Basic American Foods
Facility Location: Blackfoot
AIRS Number: 011-00012

AIR PROGRAM POLLUTANT	SIP	PSD	NSPS (Part 60)	NESHAP (Part 61)	MACT (Part 63)	SM80	TITLE V	AREA CLASSIFICATION A-Attainment U-Unclassified N- Nonattainment
SO_2	SM		X				SM	U
NO_x	A						A	U
CO	A						A	U
PM_{10}	A						A	U
PT (Particulate)	A		opacity				A	U
VOC	B						B	U
THAP (Total HAPs)	B						B	U
			APPLICABLE SUBPART					
			Dc					

[a] Aerometric Information Retrieval System (AIRS) Facility Subsystem (AFS)

[b] AIRS/AFS Classification Codes:

A = Actual or potential emissions of a pollutant are above the applicable major source threshold. For HAPs only, class "A" is applied to each pollutant which is at or above the 10 T/yr threshold, **or** each pollutant that is below the 10 T/yr threshold, but contributes to a plant total in excess of 25 T/yr of all HAPs.

SM = Potential emissions fall below applicable major source thresholds if and only if the source complies with federally enforceable regulations or limitations.

B = Actual and potential emissions below all applicable major source thresholds.

C = Class is unknown.

ND = Major source thresholds are not defined (e.g., radionuclides).

Appendix B

Emissions Inventory

P-050301 and T1-050308

Appendix C

Modeling Review

P-050301

MEMORANDUM

DATE: June 23, 2005

TO: Ken Hanna, Permitting Engineer – Air Program Division

FROM: Kevin Schilling, Modeling Coordinator – Stationary Sources, Air Program Division

PROJECT NUMBER: P-050301

SUBJECT: Modeling review for the Basic American Foods (BAF) Permit to Construct (PTC) application for boiler modifications at their Blackfoot, Idaho facility.

1.0 SUMMARY

Basic American Foods (BAF) submitted an application to modify their dehydrated food products and animal feed facility located near Blackfoot, Idaho. Air quality analyses involving atmospheric dispersion modeling of emissions associated with the proposed modification were submitted in support of a permit to construct (PTC) application to demonstrate that the modification of the stationary source would not cause or significantly contribute to a violation of any ambient air quality standard (IDAPA 58.01.01.203.02). Coal Creek Environmental Associates, LLC (Coal Creek), BAF's consultant, conducted the ambient air quality analyses.

A technical review of the submitted air quality analyses was conduced by DEQ. DEQ also conducted independent analyses to assess the potential for emissions from the modified source by itself, without considering emission reductions from existing operations, to cause an exceedance of ambient air quality standards. The submitted modeling analyses in combination with DEQ's staff analyses: 1) utilized appropriate methods and models; 2) was conducted using reasonably accurate or conservative model parameters and input data; 3) adhered to established DEQ guidelines for new source review dispersion modeling; 4) showed either a) that predicted pollutant concentrations from emissions associated with the proposed modification were below significant contribution levels (SCLs); or b) that predicted pollutant concentrations from facility-wide emissions, when appropriately combined with background concentrations, were below applicable air quality standards. Impacts of Toxic Air Pollutants (TAPs) were all below allowable increments of IDAPA 58.01.01.585 and 586. Table 1 presents key assumptions and results that should be considered in the development of the permit.

Table 1. KEY ASSUMPTIONS USED IN MODELING ANALYSES

Criteria/Assumption/Result	Explanation/Consideration
Only two of the three Boilers will be operating simultaneously.	Modeling analyses considered several operational scenarios, each scenario involving the operation of only two boilers at any time. A permit limit should be established to make this assumption enforceable. The worst-case scenario was based on operation of two boilers firing 14,384 gal/day of #6 oil.
Emissions will be controlled by a scrubber when any oil is combusted in Boilers 1 and 2.	When burning any oil, the permit should require that emissions be routed through a scrubber to control sulfur dioxide (SO_2) and PM_{10}.

2.0 BACKGROUND INFORMATION

2.1 *Proposed Modification*

BAF requested renaming the boilers: Boiler 8 is now Boiler 1; Boiler 6 is now Boiler 2; Boiler 7 is now Boiler 3.

The proposed modification involves the following:

- Removal of limits on operating hours for Boilers 1 and 2.
- Boiler 2 modified to burn No. 6 fuel oil (allowable fuels will include natural gas, No. 2 oil, and No. 6 oil).
- Maximum sulfur content for No. 6 oil combusted in Boiler 1 and 2 will be 1.75% (current limit is 1.5%).
- Only two of the boilers (No. 1, 2, or 3).will operate at any one time.
- Burning any oil in boilers 1 and 2 will be limited such that SO_2 emissions do not exceed 45.3 lb/hr.
- When Boilers 1 and 2 are burning any oil, SO_2 and PM_{10} emissions will be controlled by a scrubber, and emissions will exit through the stack for Boiler 1. When Boiler 2 is burning natural gas, emissions will not be controlled by a scrubber and emissions will exhaust through the existing stack for Boiler 2.

2.2 *Applicable Air Quality Impact Limits and Modeling Requirements*

This section identifies applicable ambient air quality limits and analyses used to demonstrate compliance.

2.2.1 Area Classification

The BAF Blackfoot facility is located in Bingham County, designated as an attainment or unclassifiable area for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), lead (Pb), ozone (O_3), and particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers (PM_{10}). There are no Class I areas within 10 kilometers of the facility.

2.2.2 Significant and Full Impact Analyses

If estimated maximum pollutant impacts to ambient air from the emissions sources of the proposed modification and associated emissions increases and decreases exceed the significant contribution levels (SCLs) of IDAPA 58.01.01.006.91, then a full impact analysis is typically necessary to demonstrate compliance with IDAPA 58.01.01.203.02. A full impact analysis for attainment area pollutants involves adding ambient impacts from facility-wide emissions to DEQ-approved background concentration values that are appropriate for the criteria pollutant/averaging-time at the facility location and the area of significant impact. The resulting pollutant concentrations in ambient air are then compared to the NAAQS listed in Table 2. Table 2 also lists SCLs and specifies the modeled value that must be used for comparison to the NAAQS.

Table 2. APPLICABLE REGULATORY LIMITS

Pollutant	Averaging Period	Significant Contribution Levels[a] ($\mu g/m^3$)[b]	Regulatory Limit[c] ($\mu g/m^3$)	Modeled Value Used[d]
PM_{10}[e]	Annual	1.0	50[f]	Maximum 1st highest[g]
	24-hour	5.0	150[h]	Maximum 6th highest[i]
Carbon monoxide (CO)	8-hour	500	10,000[j]	Maximum 2nd highest[g]
	1-hour	2,000	40,000[j]	Maximum 2nd highest[g]
Sulfur Dioxide (SO_2)	Annual	1.0	80[f]	Maximum 1st highest[g]
	24-hour	5	365[j]	Maximum 2nd highest[g]
	3-hour	25	1,300[j]	Maximum 2nd highest[g]
Nitrogen Dioxide (NO_2)	Annual	1.0	100[f]	Maximum 1st highest[g]
Lead (Pb)	Quarterly	NA	1.5[h]	Maximum 1st highest[g]

a. IDAPA 58.01.01.006.91
b. Micrograms per cubic meter
c. IDAPA 58.01.01.577 for criteria pollutants
d. The maximum 1st highest modeled value is always used for significant impact analysis
e. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
f. Never expected to be exceeded in any calendar year
g. Concentration at any modeled receptor
h. Never expected to be exceeded more than once in any calendar year
i. Concentration at any modeled receptor when using five years of meteorological data
j. Not to be exceeded more than once per year

2.2.3 Toxic Air Pollutant Impact Analysis

Toxic Air Pollutant (TAP) analysis requirements for PTCs are specified in IDAPA 58.01.01.210. If the uncontrolled emissions increase associated with a new source or modification exceeds screening emission levels (ELs) of IDAPA 58.01.01.585 or IDAPA 58.01.01.586, then air dispersion modeling must be conducted to evaluate whether TAP impacts are below applicable TAP increments. If modeled impacts are less than applicable Acceptable Ambient Concentrations (AACs) for non-carcinogens of IDAPA 58.01.01.585 and Acceptable Ambient Concentrations for Carcinogens (AACCs) of IDAPA 58.01.01.586, then compliance with TAP requirements has been demonstrated.

2.3 Background Concentrations

Background concentrations were revised for all areas of Idaho by DEQ in March 2003[1]. Background concentrations in areas where no monitoring data are available were based on monitoring data from areas with similar population density, meteorology, and emissions sources.

Background concentrations were previously provided to BAF by DEQ for use in their PTC application to burn No. 6 oil in Boiler 1 (received by DEQ on January 5, 2004). These concentrations were based on default values for rural/agricultural areas. DEQ staff were concerned that use of these background concentrations may not adequately account for impacts from Nonpareil Corporation (Facility-Wide Tier II Permit Application, January 2005), a neighboring facility immediately east of BAF. Because a full impact analysis was only necessary for NO_2, resolving concerns with background concentrations was not a substantial issue. DEQ used information obtained from Nonpareil to evaluate combined impacts (see Section 3.5). Table 3 lists default background concentrations for rural/agricultural areas in Idaho.

1 Hardy, Rick and Schilling, Kevin. *Background Concentrations for Use in New Source Review Dispersion Modeling.* Memorandum to Mary Anderson, DEQ, March 14, 2003.

Table 3. BACKGROUND CONCENTRATIONS

Pollutant	Averaging Period	Background Concentration ($\mu g/m^3$)[a]
PM_{10}[b]	Annual	26
	24-Hour	73
Carbon monoxide (CO)	8-Hour	2,300
	1-Hour	3,600
Sulfur Dioxide (SO_2)	Annual	8
	24-Hour	26
	3-Hour	34
Nitrogen Dioxide (NO_2)	Annual	17
Lead (Pb)	Quarterly	0.03

[a] Micrograms per cubic meter
[b] Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers

3.0 MODELING IMPACT ASSESSMENT

3.1 *Modeling Methodology*

Table 4 provides a summary of the modeling parameters used for DEQ's verification analyses.

Table 4. MODELING PARAMETERS

Parameter	Description/Values	Documentation/Additional Description
Model	ISC-PRIME	Version 04269
Meteorological data	Pocatello surface data Boise upper air data	1987-1992
Terrain	Terrain considered	Elevation data from digital elevation model (DEM) files
Building downwash	PRIME algorithm	Building dimensions obtained from modeling files submitted
Receptor grid	Grid 1	25-meter spacing along boundary out to 100 meters
	Grid 2	100-meter spacing out to 1,000 meters
Facility location (UTM)[a]	Easting	388 kilometers
	Northing	4,784 kilometers

[a] Universal Transverse Mercator

3.1.1 *Modeling protocol*

A modeling protocol was submitted to DEQ on January 28, 2005. The protocol was submitted by Coal Creek. The protocol was approved by DEQ and modeling was conducted in accordance with procedures discussed in the protocol.

3.1.2 Model Selection

ISC-PRIME was used by Coal Creek to conduct the ambient air analyses. ISCST3 cannot be used in this instance because numerous ambient air receptor locations exist within building recirculation cavities, and ISCST3 does not calculate concentrations within recirculation cavities. ISC-PRIME incorporates the PRIME downwash algorithm, which is also used in AERMOD, the proposed replacement model for ISCST3. The PRIME algorithm is superior to the existing downwash algorithms within ISCST3 and is capable of estimating concentrations within building recirculation cavities.

3.1.3 Land Use Classification

The area within a 3-kilometer radius is predominantly rural. Therefore, rural dispersion coefficients were used rather than urban coefficients.

3.1.4 Meteorological Data

Coal Creek used meteorological input files generated from Pocatello surface data and Boise upper air data, as requested by DEQ. These data are the most representative available for the BAF Blackfoot facility.

PCRAMMET, the meteorological data preprocessor for ISCST-3, occasionally generates unrealistically low mixing heights as a result of interpolation algorithms used with the twice daily measured mixing heights. DEQ verification modeling was conducted using meteorological data corrected for low mixing heights. All mixing height values below 50 meters were replaced with a value of 50 meters.

3.1.5 Terrain Effects

The modeling analyses submitted by Coal Creek considered elevated terrain. Elevations of receptors, buildings, and emissions sources were calculated from United States Geological Survey (USGS) 7.5 minute Digital Elevation Model (DEM) files. Elevations were recalculated from DEM files for the DEQ verification analyses.

3.1.6 Facility Layout

DEQ verified proper identification of the facility boundary and buildings on the site by comparing the modeling input to a facility plot plan submitted with the application and aerial photographs of the area.

3.1.7 Building Downwash

Plume downwash effects caused by structures present at the facility were accounted for in the modeling analyses. The Building Profile Input Program for the PRIME downwash algorithm (BPIP-PRIME) was used to calculate direction-specific building dimensions and Good Engineering Practice (GEP) stack height information from building dimensions/configurations and emissions release parameters.

3.1.8 Ambient Air Boundary

The facility fence line was used as the ambient air boundary. This satisfies the requirements of preventing public access, as described in the *Idaho Air Quality Modeling Guideline*.

3.1.9 Receptor Network

The receptor grids used by Coal Creek met the recommendations specified in the *Idaho Air Modeling Guideline*, and DEQ determined the receptor spacing used was sufficient to reasonably resolve the maximum modeled concentration.

3.1.10 Modeling Approach

The proposed project, as summarized in Section 2.1, involves changing allowable emission rates and reconfiguring how existing emissions are released. Current actual emissions were modeled as negative emissions in the significant impact analyses, and proposed future potential emissions were modeled as positive emissions. This approach provides a reasonable assessment of the impact of the proposed project on air quality.

The complexity of various operational configurations necessitates modeling of several operational scenarios. Table 5 lists the operational scenarios modeled.

Table 5. OPERATIONAL SCENARIOS INCLUDED IN MODELING ANALYSES

Operational Scenario	Description	Comments on Conservatism
#6 Oil -1	Boilers 1 and 2 operating at permitted allowable rate for No. 6 oil, Boiler 3 not operating. Short term and long term hourly emission rates are equal.	Highly expected; highly representative
#6 Oil - 3	Short term: Boiler 1 operating full on No. 6 oil and Boiler 2 not operating (reduced flow from stack for Boiler 1 and 2), Boiler 3 operating at permit allowable rate[a]. Long term: Operate as short term for 8,568 hr/yr (limit for Boiler 3 on No. 2 oil), then operate Boiler 2 on #6 Oil-1 for remaining 192 hrs.	Reasonably expected; highly representative
#2 Oil - 1	Boilers 1 and 2 operating at permitted allowable for No. 2 oil. Boiler 3 not operating. Short term and long term hourly emission rates are equal.	Reasonably expected; highly representative

[a] This scenario is somewhat different than what was modeled by Coal Creek. The short-term scenario of #6 Oil – 3 used by Coal Creek was identical to #6 Oil – 1.

3.2 Emission Rates

Emissions rates used in the dispersion modeling analyses submitted by the applicant were reviewed against those in the permit application, the engineering technical memorandum, and the proposed permit. The following approach was used for DEQ verification modeling:

- All modeled emissions rates were equal to or slightly greater than the facility's emissions calculated in the PTC application or the permitted allowable rate, whichever was larger.

- Modeling results were compared to *significant contribution* thresholds. More extensive review of modeling parameters selected was conducted when model results approached applicable thresholds.

3.2.1 Proposed Emission Limits

Table 6 lists DEQ proposed emission limits for Boiler 1 and Boiler 2. Boiler 3 is included in the table, but was not included in the significant impact modeling analyses since neither the boiler nor its method of operation would be affected by this permitting action.

Table 6. PROPOSED ALLOWABLE EMISSION LIMITS

Source	PM_{10}[a]		SO_2[b]		NO_x[c]		CO[d]	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Boiler 1	2.1		16.9		23.1		4.6	
Boiler 2	3.6		28.4		38.8		6.1	
Boiler 3	0.30		1.9		5.4		1.8	
Total[e]		17.9		142		193		

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
b. Sulfur dioxide
c. Oxides of nitrogen
d. Carbon Monoxide
e. Combined emissions from the Boiler 1, 2, and 3

3.2.2 Emissions Compared to Modeling Thresholds

The *Idaho Air Quality Modeling Guideline* suggests modeling be conducted for any criteria pollutant increase that exceeds listed modeling thresholds. Representative existing pollutant emissions must be calculated before the pollutant increase can be determined. Existing emissions were based on the highest annual average steam demand over the last two years, assuming No. 6 oil is fired in Boiler 1, as allowed by the PTC issued in 2004. Actual annual emissions were not used because the emissions prior to the PTC issued in 2004 would not be representative of the current plant configuration. Representative existing emissions were calculated using the methodology summarized in Table 7.

Table 7. CALCULATION OF EXISTING EMISSIONS

Emission Source	Averaging Period	Method to Calculate Emissions	Emissions (lb/hr[a])
Boiler 1	Hourly	Max of either 1) 227 gal/hr No. 6 oil; or 2) 36.4 MMBtu/hr Nat. Gas	PM_{10} = 3.3; SO_2 = 56.8; CO = 1.3
	Annual	1.64 MMgal/yr No. 6 oil; 19,142 MMBtu/yr Nat. Gas	PM_{10} = 2.7; SO_2 = 46.8; NO_x = 10.6; Pb = 2.8E-4
Boiler 2	Hourly	49.0 MMBtu/hr Nat. Gas	PM_{10} = 0.14; SO_2 = 0.03; CO = 3.3
	Annual	249,791 MMBtu/yr Nat. Gas	PM_{10} = 0.079; SO_2 = 0.023; NO_x = 1.1; Pb = 1.4E-5
Total	Hourly	Combined Boiler 1 and Boiler 2	PM_{10} = 3.5; SO_2 = 56.8; CO = 4.6
	Annual	Combined Boiler 1 and Boiler 2	PM_{10} = 2.8; SO_2 = 46.8; NO_x = 11.7; Pb = 2.9E-4

a Pounds per hour

Table 8 shows a comparison of emission increases to modeling thresholds, above which modeling is required. Boiler 3 is not modified as part of this PTC application, so neither existing nor allowable emissions from this boiler were included in the modeling applicability determination.

Table 8. MODELING APPLICABILITY DETERMINATION (BOILER 1 AND 2)

Pollutant	Avg. Period	Current Emissions (lb/hr)	Future Allowable Emissions (lb/hr)	Emission Increase (lb/hr)	Modeling Threshold (lb/hr)	Modeling Required
PM_{10}[a]	24-hr	3.5	5.7	2.2	0.2	Yes
	Annual	2.8	5.7	2.9	0.2	Yes
SO_2[b]	≤24-hr	56.8	45.3	-11.5	0.2	No
	Annual	46.8	45.3	-1.5	0.2	No
CO[c]	<24-hr	4.63	10.7	6.1	14	No
NO_x[d]	annual	11.7	61.9	50.2	0.23	Yes
Pb[e]	Quart.	3.4E-4	5.6E-4	2.2E-4	0.14	No

a. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
b. Sulfur dioxide
c. Carbon Monoxide
d. Oxides of nitrogen
e. Lead

Because of the change in emission release parameters, DEQ also modeled the proposed project by itself, without modeling emissions from the current configuration as negative values.

3.2.3 Emission Rates for Modeled Scenarios

The proposed project involves fuel changes, control equipment additions, and changes in how emissions are released (location of release and changes in release parameters such as flow rate, temperature, stack height, and stack diameter). Table 9 provides a description of the emission sources used in the modeling analyses. Tables 10, 11, and 12 list emissions used in the various modeling scenarios. Table 13 summarizes NO_x emissions from the boilers for various operational scenarios for the full impact analyses. Facility-wide NO_x emissions from other sources at the facility are provided in Appendix A. Appendix A also includes NO_x emissions from the neighboring Nonpariel facility that were used for a combined impact analysis conducted by DEQ (see Section 3.5)

Table 9. EMISSION SOURCES USED IN THE MODELING ANALYSES

Emission Source Code	Description
BLR6_VRT	Boiler 2 firing natural gas under current conditions.
BLR6_GAS	Boiler 2 firing natural gas under future conditions where exhausts from Boiler 1 and 2 are not merged.
BLR7	Boiler 3.
B8GS_VRT	Boiler 1 firing natural gas under current conditions.
B8OL_VRT	Boiler 1 firing No. 6 oil under current conditions.
BLR6_8	Boiler 1 and 2 under future conditions where exhausts are merged.
BLR8_GAS	Boiler 1 firing natural gas where exhausts from Boiler 6 and 8 are not merged.

Table 10. CRITERIA POLLUTANT EMISSION RATES USED FOR MODELING OF SCENARIO #6 OIL – 1[a]

Emission Point	Rate Used for Modeling (lb/hr)[b]		
	PM_{10}[c] Short	PM_{10} Annual	NO_x[d]
BLR6_VRT (Boiler 2 existing)	-0.14	-0.079	-1.1
B8GS_VRT (Boiler 1 existing for natural gas)	NA	-0.0064	-0.30
B8OL_VRT (Boiler 1 existing for #6 oil)	-3.3	-2.7	-10.3
BLR6_8 (combined Boiler 1 and 2)	5.7	5.7	61.9 (41.6[e])

a. Boilers 1 and 2 operating at permitted allowable for No. 6 oil, Boiler 3 not operating
b. Pounds per hour
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
d. Oxides of nitrogen
e. Value used in Coal Creek analyses - this value differs from the DEQ value because of differences in calculated permit allowable emissions

Table 11. CRITERIA POLLUTANT EMISSION RATES USED FOR MODELING OF SCENARIO #6 OIL – 3[a]

Emission Point	Rate Used for Modeling (lb/hr)[b]		
	PM_{10}[c] Short	PM_{10} Annual	NO_x[d]
BLR6_VRT (Boiler 2 existing)	-0.14	-0.079	-1.1
B8GS_VRT (Boiler 1 existing for natural gas)	NA	-0.0064	-0.30
B8OL_VRT (Boiler 1 existing for #6 oil)	-3.3	-2.7	-10.3
BLR6_8 (combined Boiler 1 and 2)[e]	2.1	2.1	23.1 (16.1[f])

a. Boilers 1 operating at permitted allowable for No. 6 oil, Boiler 2 not operating, Boiler 3 operating at permitted allowable rate
b. Pounds per hour
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
d. Oxides of nitrogen
e. Reduced flow from Boiler 2 not operating; emissions equal to permit limit for Boiler 1
f. DEQ value differs from submitted value because lb/hr NO_x emission differences

Table 12. CRITERIA POLLUTANT EMISSION RATES USED FOR MODELING OF SCENARIO #2 OIL – 1[a]

Emission Point	Rate Used for Modeling (lb/hr)[b]		
	PM_{10}[c] Short	PM_{10} Annual	NO_x[d]
BLR6_VRT	-0.14	-0.079	-1.1
B8GS_VRT	NA	-0.0064	-0.30
B8OL_VRT	-3.3	-2.7	-10.3
BLR6_8	0.75	0.75	18.2

a. Boilers 1 and 2 operating at permitted allowable for No. 2 oil, Boiler 3 not operating.
b. Pounds per hour
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
d. Oxides of nitrogen

Table 13. NO_x EMISSION RATES FROM BOILERS FOR FULL IMPACT ANALYSES

Operational Scenario / Emission Point	NO_x Emission Rate Used for Modeling (lb/hr)[a]
#6 Oil - 1	
BLR6_8	61.9
#6 Oil – 3	
BLR7	5.25
BLR6_8	23.1
#2 Oil - 1	
BLR6_8	18.2

a. Pounds per hour

3.2.4 Emission Rates for TAPs Included in the Modeling Analyses

The difference between current actual TAP emissions and future allowable TAP emissions were used to evaluate the need for modeling TAPs, as per IDAPA 58.01.01.210.05. The submitted application referred to this approach as "netting." However, "net emission increase" for TAPs is defined by IDAPA 58.01.01.007.06 as those emissions increases and decreases occurring from July 1, 1995.

Table 14 lists TAP emissions rates modeled for each operational scenario where emission increases associated with the modification, for either controlled or uncontrolled emissions, exceeded the applicable screening emission levels (ELs).

Table 14. TAP EMISSIONS RATES MODELED

Operational Scenario / Emission Unit	Controlled TAP emission increase modeled (lb/hr[a])							
	As[b]	Cd[c]	Cr6[d]	Ni[e]	Be[f]	V2O5[g]	Form.[h]	POM[i]
#6 Oil – 1 / BLR6_8	1.19E-4		2.08E-5	8.14E-3		5.54E-3	1.43E-2	5.06E-6
#6 Oil – 3 / BLR6_8		1.66E-5			1.09E-4		1.00E-2	
#2 Oil – 1 / BLR6_8		4.34E-5			1.80E-4		3.04E-2	

a. Pounds per hour
b. Arsenic
c. Cadmium
d. Hexavalent chromium
e. Nickel
f. Beryllium
g. Vanadium as V2O5
h. Formaldehyde
i. Policyclic organic matter

3.3 Emission Release Parameters

Table 15 provides emissions release parameters, including stack location, stack height, stack diameter, exhaust temperature, and exhaust velocity.

Table 15. EMISSIONS AND STACK PARAMETERS

Release Point / Operational Scenario	Stack Location in UTM (m)[a]		Stack Height (m)	Modeled Diameter (m)	Stack Gas Temp. (K)[b]	Stack Gas Flow Velocity (m/sec) [c]
BLR6_VRT	E387801.0[d]	N4783975[d]	15.2	1.1	422	9.6
BLR6_GAS	E387801.0[d]	N4783975[d]	15.2	1.1	422	13.3
BLR7	E387794.3	N4783961	13.4	0.85	519	15.4
B8GS_VRT	E387828.4	N4783966	30.5	1.1	422	10.0
B8OL_VRT	E387828.4	N4783966	30.5	1.1	408	6.4
BLR6_8	E387828.4	N4783966	30.5	1.1	320	15.2 (5.68[e]) (20.1[f])
BLR8_GAS	E387828.4	N4783966	30.5	1.1	320	10.0

a. Meters
b. Kelvin
c. Meters per second
d. Location corrected by DEQ. Originally submitted modeling incorrectly positioned the stack at the same location as B8GS_VRT, B8OL_VRT, BLR6_8, and BLR8_GAS
e. Flow when only Boiler 1 operating
f. Flow when firing No. 2 oil

3.4 Results

3.4.1 Significant Impact Analyses

Table 16 summarizes the results of the significant impact analyses. A full impact analysis, including facility-wide emissions, was needed for NO_x because the maximum modeled impact of the proposed sources exceeded SCLs.

Table 16. RESULTS OF SIGNIFICANT IMPACT ANALYSES

Pollutant / Operating Scenario	Averaging Period	Year	Maximum Modeled Concentration[a] ($\mu g/m^3$)[b]	Significant Contribution Level ($\mu g/m^3$)	Facility-Wide Modeling Required
PM_{10}[c]					
#6 Oil - 1	24-hour	1987	3.1 (3.1)	5.0	No
	Annual	1991	0.51 (0.53)	1.0	No
#6 Oil - 3	24-hour	1987	1.7	5.0	No
	Annual	1988	0.133	1.0	No
NO_2[d]					
#6 Oil - 1	Annual	1991	7.3 (8.3)	1.0	Yes
#6 Oil - 3	Annual	1991	3.4 (4.2)	1.0	Yes
#2 Oil - 1	Annual	1991	(2.7)	1.0	Yes

a. Values in parentheses are modeling results obtained by Coal Creek
b. Micrograms per cubic meter
c. Particulate matter with an aerodynamic diameter less than or equal to a nominal 10 micrometers
d. Nitrogen dioxide – value assumed to be 75 % of the modeled NO_x value

3.4.1 Full Impact Analyses

Table 17 summarizes the NO_2 full impact analyses. All modeled concentrations, when combined with a conservative background concentration, were well below the applicable NAAQS. Results obtained from DEQ verification modeling were substantially larger than those obtained by Coal Creek. Review of the modeling files indicated Coal Creek modeled facility-wide emissions with impacts of existing boiler operations subtracted out. Since facility-wide modeling is performed to assess impacts of emissions from the entire facility, impacts from previous actual emissions should not be disregarded.

Table 17. RESULTS OF THE NO_2 FULL IMPACT ANALYSES

Operating Scenario	Averaging Period	Year	Maximum Modeled Concentration[a] ($\mu g/m^3$)[b]	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	Percent of 100 $\mu g/m^3$ NAAQS
#6 Oil - 1	Annual	1991	20.4 (12.9)	17	37.4 (29.9)	37
#6 Oil - 3	Annual	1990	13.6 (11.2)	17	30.6 (28.2)	31
#2 Oil - 1	Annual	1988	(6.4)	17	(23)	23

[a] Nitrogen dioxide values assumed to be 75% of the modeled NO_x value - values in parentheses are modeling results obtained by Coal Creek

[b] Micrograms per cubic meter

3.4.2 TAP Analyses

Table 18 summarizes the ambient TAP analyses. Maximum annual impacts of controlled carcinogenic TAPs were well below applicable AACCs, thereby demonstrating preconstruction TAP compliance via IDAPA 58.01.01.210.08 (Controlled Ambient Concentration). DEQ did not conduct verification analyses for TAPs because model results obtained by Coal Creek were less than half the allowable increment for all TAPs. Uncontrolled emissions of all non-carcinogenic TAPs were below the screening emission levels (ELs), below which dispersion modeling is not required.

Table 18. RESULTS OF TAP ANALYSES

TAP	Averaging Period	Year	Maximum Modeled Concentration ($\mu g/m^3$)[a]	AACC ($\mu g/m^3$)	Percent of AACC
#6 Oil –1					
POM	Annual	1991	<0.00001	0.45	<0.002
Formaldehyde	Annual	1991	0.00330	0.077	4
Arsenic	Annual	1991	0.00003	0.00023	13
Chromium VI	Annual	1991	0.00001	0.00008	13
Nickel	Annual	1991	0.00193	0.00420	46
Vanadium	24-hour	1987	0.0101	2.5	0.4
#6 Oil –3					
Formaldehyde	Annual	1988	0.00101	0.077	1.3
Beryllium	Annual	1990	0.00001	0.0042	0.2
Cadmium	Annual	1991	0.00001	0.00056	1.8
#2 Oil – 1					
Formaldehyde	Annual	1991	0.00504	0.0770	6.5
Beryllium	Annual	1991	0.00003	0.0042	0.7
Cadmium	Annual	1991	0.00001	0.00056	1.8

[a] Micrograms per cubic meter

3.5 *Additional DEQ Analyses*

Two supplemental analyses were performed by DEQ to verify NAAQS compliance.

3.5.1 Impact of Total Emissions from Boiler Operational Scenarios

DEQ conducted an analysis similar to the significant impact analysis for operational scenario #6 Oil – 1 (Boilers 1 and 2 operating continuously on No. 6 oil), except the impact of total emissions was assessed rather than the emission increase associated with the proposed project. These analyses were conducted to ensure the operation of the equipment as proposed will not, by itself, cause an exceedance of NAAQS.

Table 19 summarizes the results of the modeling analyses.

Table 19. RESULTS OF THE DEQ TOTAL BOILER IMPACT ANALYSES

Pollutant / Operating Scenario	Averaging Period	Year	Maximum Modeled Concentration ($\mu g/m^3$)[a]	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	NAAQS ($\mu g/m^3$)	Percent of NAAQS
PM_{10}							
#6 Oil - 1	24-hour	1990	7.9	73	80.9	150	54
	Annual	1991	1.13	26	27.1	50	54
NO_2							
#6 Oil - 1	Annual	1991	9.2	17	26.2	100	26

a. Micrograms per cubic meter

3.5.2 BAF/Nonpariel Combined NO_2 Impacts

DEQ had concerns that impacts from the neighboring Nonpariel Corporation facility would not be accounted for in the background concentrations used in the full impact analysis. NO_x emissions from the Nonpariel facility were modeled along with BAF's emissions to ensure combined impacts were below the 100 $\mu g/m^3$ NAAQS. The NO_x emissions inventory for Naonpariel was obtained from a recently submitted facility-wide Tier II permit application and is listed in Appendix A. This modeling was conducted for BAF operational scenario #6 Oil – 1 and was modeled for 1991 only. Modeling results for NO_2 from combined emissions of BAF and Nonpariel are summarized in Table 20.

Table 20. RESULTS OF COMBINED BAF/NONPARIEL
NO2 FULL IMPACT ANALYSES

Operating Scenario	Averaging Period	Year	Maximum Modeled Concentration[a] ($\mu g/m^3$)[b]	Background Concentration ($\mu g/m^3$)	Total Ambient Concentration ($\mu g/m^3$)	Percent of 100 $\mu g/m^3$ NAAQS
#6 Oil - 1	Annual	1991	17.6	17	34.6	35

a. Nitrogen dioxide values assumed to be 75% of the modeled NO_x
b. Micrograms per cubic meter

4.0 CONCLUSIONS

The air quality analyses submitted with the PTC application, in combination with DEQ's analyses, demonstrated to DEQ's satisfaction that the proposed modification will not cause or significantly contribute to an exceedance of any air quality standard, as required by IDAPA 58.01.01.203.02.

APPENDIX A

BAF AND NONPARIEL FACILITY-WIDE NO_X EMISSIONS USED IN MODELING

BAF AND NONPARIEL FACILITY-WIDE NO_X EMISSIONS USED IN MODELING

Source ID	Facility	Easting (X) (m)	Northing (Y) (m)	Base Ele (m)	Stack Height (m)	Temp (K)	Exit Vel (m/s)	Stack Dia. (m)	NO_X-ANN (lb/hr)
BLR6_8	BAF	387828.4	4783966	1363.4	30.48	319.82	15.229	1.07	61.9
AEV	BAF	387763.8	4783921	1363.4	15.5204	299.82	16.827	0.814	0.1683
CBB	BAF	387802.6	4783908	1363.4	11.7348	327.59	12.25	0.585	0.0765
CHX	BAF	387779.7	4783917	1363.4	12.2926	360.93	8.46	0.972	0.4323
CHY	BAF	387784.1	4783917	1363.4	9.5738	348.15	7.481	0.631	0.1613
CHZ	BAF	387789.4	4783917	1363.4	10.921	359.26	4.541	0.555	0.0796
CNV	BAF	387825	4783899	1363.5	19.5072	477.59	26.663	0.914	0.612
CNW	BAF	387818.1	4783899	1363.4	19.5072	477.59	26.663	0.914	0.612
CTQ	BAF	387801.4	4783903	1363.4	11.177	343.71	12.16	0.594	0.2093
CTR	BAF	387798.3	4783903	1363.4	10.8204	330.37	21.058	0.396	0.1779
CTS	BAF	387795	4783903	1363.4	10.8204	329.26	11.767	0.338	0.0744
CTT	BAF	387788.1	4783902	1363.4	10.8204	323.15	13.63	0.338	0.0892
CXX	BAF	387825.5	4783923	1363.5	12.573	323.15	17.746	0.762	0.5822
CYY	BAF	387826.1	4783917	1363.6	14.0452	320.93	0.001	0	0.3527
DHT	BAF	387762	4783952	1363.4	15.3162	333.15	22.377	0.914	0.539
DHU	BAF	387767.3	4783952	1363.4	20.065	333.15	22.377	0.914	0.539
DHZ	BAF	387769.4	4783957	1363.4	20.065	330.37	13.511	0.914	0.306
DQA	BAF	387764.9	4783937	1363.4	19.4554	333.15	14.151	1.067	0.539
DQB	BAF	387756.8	4783937	1363.4	19.4554	333.15	14.151	1.067	0.539
DUQ	BAF	387764.9	4783943	1363.4	19.0256	333.15	14.995	1.067	0.539
DUT	BAF	387756.8	4783943	1363.4	19.0256	333.15	14.995	1.067	0.539
DUV	BAF	387768.5	4783938	1363.4	20.9794	330.37	15.2	1.219	0.612
HEB	BAF	387824.6	4783882	1363.5	17.8308	350.37	0.001	0	0.2911
HNL	BAF	387809.2	4783875	1363.4	6.8072	343.15	0.001	0	0.0869
TAC	BAF	387617.3	4784000	1363.3	13.716	505.37	14.068	0.387	0.06375
TAH	BAF	387617.3	4784003	1363.3	13.716	505.37	12.192	0.415	0.06375
TCD	BAF	387631.3	4784028	1363.7	9.906	337.59	0.001	0	0.102
EU_01	Nonpar	388318	4784088	1365	12.4968	483.15	11.491	0.701	14.85
EU_02	Nonpar	388313	4784088	1365	12.4968	483.15	6.767	0.914	1.99
EU_03	Nonpar	388351.6	4784018	1365	8.5344	306.48	9.053	0.610	0.412
EU_04	Nonpar	388373.6	4784098	1365	13.716	306.48	16.916	0.853	0.539
EU_20	Nonpar	388071.5	4783957	1364	8.5344	466.48	6.157	0.488	1.029
EU_21	Nonpar	388069.9	4783953	1364	8.5344	466.48	1.402	0.914	0.824
EU_22	Nonpar	388100.4	4783938	1364	10.9728	359.26	12.436	0.762	0.627
EU_23	Nonpar	388115	4783937	1364	9.144	338.71	5.761	0.914	0.275
EU_24	Nonpar	388094.3	4783938	1364	10.9728	359.26	12.436	0.762	0.627
EU_25	Nonpar	388106.5	4783928	1364	9.144	338.71	5.761	0.914	0.275
EU_26	Nonpar	388090	4783926	1364	10.9728	359.26	12.436	0.762	0.627
EU_27	Nonpar	388104	4783921	1364	9.144	338.71	8.291	0.762	0.275
EU_28	Nonpar	388085.7	4783915	1364	7.0104	344.26	10.363	0.762	0.468
EU_29	Nonpar	388093	4783913	1364	7.0104	338.71	6.462	0.610	0.032
EU_30	Nonpar	388105.6	4783910	1364	7.0104	327.59	3.993	0.549	0.029
EU_31	Nonpar	388083.7	4783910	1364	8.2296	344.26	14.569	1.036	1.020
EU_32	Nonpar	388100.8	4783906	1364	8.2296	338.71	10.516	0.792	0.314
EU_33	Nonpar	388106.9	4783905	1364	8.2296	327.59	11.339	0.610	0.324
EU_39	Nonpar	388146	4783830	1364	7.3152	308.15	0.001	0.152	0.086
EU_01_NG	Nonpar	388318	4784088	1365	12.4968	483.15	11.491	0.701	1.985
EU_02_NG	Nonpar	388313	4784088	1365	12.4968	483.15	6.767	0.914	1.985